



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Applicant:** STEPHEN BUSH

**Examiner:** Rivero, Minerva

**Serial No:** 10/015,025

**Art Unit:** 2655

**Filed:** December 11, 2001

**Docket:** 14876

**For:** APPARATUS FOR NATURAL  
LANGUAGE CONTROL OF  
UNINHABITED AIR VEHICLES

**Confirmation No.:** 6341

**Dated:** April 19, 2005

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION PURSUANT TO 37 C.F.R. § 1.131**

Sir:

I, STEPHEN FRANCIS BUSH, hereby declare that:

1. I am the Applicant in the above-captioned U.S. Patent Application Serial No. 10/015,025 filed on 11 December 2001.
2. In an Office Action dated 19 January 2005, U.S. Patent No. 6,655,631 to Austen-Brown (hereinafter, "Austen-Brown"), which claims priority to a U.S. Provisional Application filed 26 July 2001, has been identified as a reference in the present application.
3. I conceived of the invention disclosed and claimed in the present Application prior to 26 July 2001, and exercised diligence at least through the time of the filing of the present Application.
4. As evidence of the prior conception of said invention prior to the effective filing date of Austen-Brown, annexed hereto is Exhibit A. Exhibit A consists of true

photocopies of the document "GECRD Patent Disclosure Letter System" pertaining to my invention that I prepared and submitted to my patent attorney, which evidences a conception of the claimed invention prior to the 26 July 2001 effective filing date of the Austen-Brown provisional application. Dates and names have been redacted in the preparation of the photocopies contained in the attached exhibits. Exhibit A is believed fully to support the subject matter claimed by the claims rejected over Austen-Brown.

5. I further declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true. I further declare that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the patent application or any patent issued thereon.

Dated: April 19, 2005

  
Stephen Francis Bush

**GECRD Patent Disclosure Letter System****DOCKET NUMBER**

29489

**DOCKET DATE****REDACTED****TITLE OF INVENTION**

Apparatus for Natural Language Control of Uninhabited Air Vehicles

**INTERESTED GE COMPONENT(S)**

- Lockheed Martin

**Keywords:**

- eBusiness
- Services and Replacement Parts
- Business Methods

**CRD PROJECT NAME**

Uninhabited Air Vehicles

**CRD PROJECT NUMBER**

2123321004

**CRD PROJECT LEADER**

Johnson, Timothy L.

**BUSINESS OR ORG. CONTACT INFORMATION****NAME** Richard Abbot**PHONE NUMBER****REDACTED**

Was this invention first conceived or reduced to practice in the performance of work under a contract between GE and another non-government third party? YES

**REDACTED****REDACTED**

THIRD PARTY NAME Lockheed Martin

PHONE NUMBER

REDACTED

Date Invention Conceived :

REDACTED

Circumstances Invention Conceived i.e., described in patent notebook (include page #), technical report, letter, discussed in meeting minutes, etc.

The invention was conceived as part of the UAV (Uninhabited Air Vehicle) Project. It is recorded in the patent notebook of Stephen F. Bush.

Was this invention first conceived or reduced to practice in the performance of work under a US Government contract, either with CRD or with another component? NO

**ABSTRACT OF THE INVENTION**

Please write a brief explanation of the invention (Limit to 350 words)

This invention combines speech recognition with device state in order to improve speed and accuracy of recognition. This is generally useful for natural language processing throughout General Electric as well as Lockheed Martin. In this particular application, safe interaction with other aircraft is a critical requirement for Uninhabited Air Vehicles (UAVs) to become widely deployed. This invention allows UAVs to respond to and issue voice commands such that they can communicate with human air traffic controllers.

**BACKGROUND OF THE INVENTION**

Please describe the problem or requirement addressed by your invention.

Air Traffic Control (ATC) is currently an analog, voice communication based process. Until the process changes, this requires that any autonomous air vehicle will have to appear to ATC as a human pilot controlled vehicle. This invention enables the UAV to listen and respond with natural human language.

How has this problem or requirement been addressed before?

Previous to this invention, UAVs have only been rarely deployed. In those instances when they are deployed, they are deployed in areas far from commercial air traffic for obvious safety reasons.

Is this disclosure letter related to any other CRD or GE disclosure letters, patent applications or issued patents?

NO

Have you completed a prior art search? NO

REDACTED

REDACTED

**Please list any relevant literature or patents of which you are aware.**

#### **DETAILED DESCRIPTION OF THE INVENTION**

##### **How does your invention work?**

Communication takes place through current analog wireless technology. A speech recognizer generates textual words from the audio transmission. The text is parsed in order to understand the command required of the vehicle. Responses from the vehicle are generated based both upon the vehicles current state, predicted state, and previous command. A textual response is generated, converted to audio, then transmitted to ATC.

**Describe the important features of your invention and explain how to use the invention to solve the problems described above.**

Because of the potentially dangerous and rapid maneuvers required by the UAV, the natural language processing must be fast with very high accuracy. There is no tolerance for error.

**What advantages are provided by your invention?**

Fast and accurate speech processing as well as rapid response to failure.

**Has your invention been reduced to practice? NO**

**Briefly describe any efforts to make a prototype of your invention or to test your invention. Additionally, summarize the results of any related experiments and testing and highlight any results of particular significance.**

Prototype is under construction for Lockheed Martin.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

**Please describe the significance of any pictures, drawings, graphs, diagrams, structures or figures and the type of picture along with the specific view or application to the invention.**

#### **CLAIMED INVENTION**

**Please identify novel aspects that should be protected within this disclosure letter.**

Fast and accurate speech processing. Unique and safe response to failure.

#### **ATTACHED FILES**

No attachments for this invention

REDACTED

REDACTED

DUT IF DISCLOSURE		
a.	Have steps been taken to put into use, either outside GE or in our own operations?	No
b.	Has the invention or a product embodying or using it been sold or offered for sale?	No
c.	If the invention pertains to a process, have any steps been taken to employ the process commercially (e.g., for product production)?	No
d.	Has the invention been described in an electronic or printed publication?	No
e.	Has the invention been described to persons who are not employees of GE?	No
f.	Are there results available of a prior art search pertaining to this invention?	No
g.	Has anyone else associated with the project within GE (marketing, sales, sourcing, etc.) disclosed the invention or offered the invention for sale?	No
h.	If you answered Questions a-g as "NO", is any use, sale, publication, or disclosure of the invention now contemplated?	No
! = Answer changed from Yes to No		

## CO-INVENTORS

First Name	Last Name	Email	Phone	Reviewed
*Stephen	Bush	REDACTED	REDACTED	Yes
*Lead co-inventor				

Associated Lab/Program: Global Electronic Systems Lab (5200)/Systems & Network Applications (5330)

Assigned Attorney: John Thompson

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